UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/780,179	02/09/2001	Thomas J. Quigley	1875.1320001	9211

7590 04/19/2005

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 New York Avenue, N.W.
Washington, DC 20005-3934

EXAMINER	
MOORE, IAN N	
ART UNIT	**PAPER NUMBER**
2661	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/780,179	QUIGLEY ET AL.
	Examiner	**Art Unit**
	Ian N Moore	2661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29,32,33 and 36-42* is/are rejected.

7)☒ Claim(s) *30,31,34 and 35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11-12-04*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The information disclosure statement filed on 11-12-2004, which includes all the references cited in the first IDS and new/additional references with corrected application number and the filing date, is considered by the examiner.

2. Claim objections, on claims 15 and 34 are withdrawn since they are being amended accordingly.

3. Claims 1,6,7,15-17,24,-27,28,30,34,36,41 and 42 are amended.

4. Claims 1-29,32,33,36-42 are rejected by the same ground of rejections.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1,3,5,8,11,13,14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eng (U.S. 5,963,557) in view of Sambamurthy (U.S. 6,108,713).

Regarding Claim 1, Eng'557 discloses a cable modem termination system for a cable plant or a headend terminal for a bidirectional asymmetric, transmission system (see FIG. 7, Headend 112; note that headend 112 is the cable modem termination system of the cable plant system since it communicate with other networks 30) having a downstream channel (see FIG. 7, down stream control and

payload channel) that broadcasts data from the head end terminal to a plurality of subscriber terminals (see FIG. 7, three Subscriber Stations, SS, 150) and an upstream channel (see FIG. 7, Upstream control/payload channel) that unicasts data from the individual subscriber terminals to the head end terminal, the headend terminal comprising:

a burst receiver (see FIG. 14, a combined system of Upstream Payload channel RF receiver 254 and control channel RF receiver 255) for processing data signals having physical layer parameters that control the manner in which the data signals are transmitted (see col. 16, lines 42 to col. 17, lines 6; note that the combined system of receivers process mini-slot status information signals; mini slot information controls the manner in which data signals are transmitted by way of the collision statistics (i.e. number of collisions)) transmitted on an upstream channel of the cable plant (see col. 16, lines 42-67; note that the combined system of receivers process mini-slot status information transmitted by subscriber station SS via upstream channel);

a transmitter (see FIG. 14, Downstream RF transmitter 256) for sending messages on a downstream channel of the cable plant to cable modems (see FIG. 7, three Subscriber Stations, SS, 150; see col. 16, lines 26-42; note that downstream RF transmitter transmits the control and payload messages via down stream channel towards SS), and

a monitoring circuit (see FIG. 14, a headend controller which comprises Headend Media Access Controller 262, Mini slot collection status 294 and collection

detector 290; see col. 16, lines 25-27) for collecting packet based statistics representative of the transmission quality of the upstream channel (see col. 17, lines 45-67; note that the headend controller collects/maintains the statistical transmission quality data (i.e. number of mini-slot collisions) regarding the packets/payload; the statistical data, which represent the transmission quality, is the same as the number of collision, which represent the transmission quality, since collision has a significant impact on the quality of the transmission),

the monitoring circuit sending a message to the transmitter for the cable modems to change a physical layer parameter (col. 17, lines 8; 46-67; a mini-slot status information; also note that mini slot are generated and processed at the physical layer) responsive to the collected statistics (see FIG. 15, S20-S25; see FIG. 13, S11-S14 and S17; see col. 16, lines 58 to col. 17, lines 8; 46-67; see col. 18, lines 1-22; see col. 15, lines 29-46; note that according to maintained/collected mini-slot collision statistics, the headend controller instructs the downstream RF transmitter to change/update mini-slot status information by sending a control message (i.e. see FIG. 14, collection status message). Consequently, the upstream transmitter sends the collision detected control packet to the downstream SS to change/modify the mini-slot status information. In response to receiving a control packet, the SS changes/modifies the mini-slot status information by determining when to retry) and

the burst receiver process data signals based on the changed physical layer parameter (see FIG. 15, S21, and FIG. 13, S13, S14, S17; see col. 16, lines 57-67,

see col. 18, lines 1-5; see col. 15, lines 29-52; note that after the control packet is send from the downstream RF transmitter 256 to SS, SS retransmits the packets/payloads according to the changed/modified mini-slot status information. The combined system of receivers processes the packet according to the changed/modified mini-slot status).

Eng'557 does not explicitly disclose sending a message to the receiver to process data signals.

However, the above-mentioned claimed limitations are taught by Sambamurthy'713. In particular, Sambamurthy'713 teaches a monitoring circuit (see FIG. 2, a combined system of microRISC stream processor 114 and Super MAC management 117) sending a message (see FIG. 2, an instruction/message is sent to/from the combined management system) to the transmitter (see FIG. 2, Tx Super MAC controller 118) to change a physical layer parameter responsive to the collected statistics (see col. 10, lines 42 to col. 11, lines 52; see col. 12, lines 32-42; note that the combined management system sends the management/control command/instruction to the transmitter to change/modify the physical layer parameter/limitation according to the stored statistics) and

to the receiver (see FIG. 2, Rx Super MAC Controller 120) to process data signals based on the changed parameter (see col. 10, lines 42 to col. 11, lines 52; see col. 12, lines 32-42; note that the combined management system sends the management/control command/instruction to the receiver to process the

packet/data/signal according to the changed/modified the physical layer parameter/limitation; see col. 12, lines 56 to col. 13, lines 37; also see FIG. 3).

In view of this, having the system of Eng'557 and then given the teaching of Sambamurthy'713, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Eng'557, for the purpose of providing mechanism of sending a message/instruction to the receiver to process the packet/data/signal, as taught by Sambamurthy'713, since Sambamurthy'713 states the advantages/benefits at col. 13, lines 1-8, that it would synchronize the processing between the transmitter and receiver for most efficient and fastest communication. The motivation being that by instructing the receiver in order to synchronize with the transmitter, it will reduce the error or failures due to mismatch processing of data between transmit and receive signals/data.

Regarding claim 3, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets). Sambamurthy'713 further discloses collecting statistics about the number of packets without a unique word (see FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; Table 4 and 5; note the statistical data is collected regarding the number of un-valid packet whose word/byte is not unique/standard size (i.e. errorLong and errorShort). Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to modify the system of Eng'557 as taught by Sambamurthy'713 for the same reason stated in Claim 1 above.

Regarding claim 5, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets). Sambamurthy'713 further discloses collecting statistics about the number of packets with uncorrectable errors (see FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; Table 4; note the statistical data is collected regarding the number of uncorrectable errors (i.e. revError, errorFrame, errorOverFlow, errorCRE, and errorProtocol). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Eng'557 as taught by Sambamurthy'713 for the same motivation stated in Claim 1 above.

Regarding claim 8, the combined system of Eng'557 and Sambamurthy'713 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 1. Eng'557 further discloses utilizing different types of modulation (see col. 9, lines 25-46; note that different types of modulation (i.e. BPSK, QPSK, and QAM) are used in the headend. Headends directs the packets to be sending on different type of modulation. Thus, it is clear that the

headend sends to change/modify physical layer parameters/limitations/requests (i.e. modulation types).)

Regarding claim 11, the combined system of Eng'557 and Sambamurthy'713 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 1. Eng'557 further discloses changing the guard time (see col. 3, lines 33-65; note that the guard time is changed/updated by increasing or informing SS regarding the propagation delay and time boundary).

Regarding claim 13, the combined system of Eng'557 and Sambamurthy'713 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 1. Sambamurthy'713 further discloses processing in real time (see col. 7, lines 60 to col. 8, lines 6; note that the packets are monitored and processed simultaneously in parallel manner. Thus, it is clear that the system is processing data packets in real time). Note that Eng'557 discloses the monitored system of sending a message to change the physical layer parameter. Sambamurthy'713 discloses the monitored system, which process the packets simultaneously in real-time manner.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Eng'557 as taught by Sambamurthy'713, by providing the simultaneously monitoring and processing mechanism for the same motivation stated in Claim 1 above.

Regarding claim 14, the combined system of Eng'557 and Sambamurthy'713 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 1. Eng'557 further discloses changing/fine-tuning/adjusting the frequency of the carrier (see FIG. 16, Tuner 278; see col. 16, lines 26-42, see col. 10, lines 50-67; see col. 6, lines 12-31; note that the carrier or center frequency is changed/fin-tuned by performing "burst sync"). Thus, it is clear that a message to change the physical layer parameter is the changed/adjusted parameter.

Regarding Claim 16, the claim, which has substantially disclosed all the limitations of the respective claim 1. Therefore, it is subjected to the same rejection.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Sambamurthy'713, as applied to claim 1 above, and further in view of Nixon (U.S. 5,995,916).

Regarding claim 2, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets). Sambamurthy'713 discloses the collecting statistics about the number of packets (see FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; note the statistical data is collected regarding the number of packets).

Neither Eng'557 nor Sambamurthy'713 explicitly discloses the collecting undetected packets (see Nixon'916, col. 32, line 39-54; note that statistical information is held/collected in counters which counts the received unknown protocol messages/packets, which are unable to detected).

However, the above-mentioned claimed limitations are taught by Nixon'916. In view of this, having the combined system of Eng'557 and Sambamurthy'713, then given the teaching of Nixon'916, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Sambamurthy'713, for the purpose of providing a mechanism for collection the counts of the received unknown protocol messages, as taught by Nixon'916, since Nixon'916 states the advantages/benefits at col. 3, lines 30-44 that it would provide a diagnostic monitoring of multiple system components. The motivation being that by collection/counting the counts of unknown protocol messages, it can increase the diagnostic monitoring capability by having knowledge of exact count of received unknown messages.

8. Claims 4,6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Sambamurthy'713, as applied to claim 1 above, and further in view of Paratore'358 (U.S. 5,666,358).

Regarding claim 4, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294

and collection detector 290) collects statistics regarding the number of packets). Eng'557 further discloses correction errors (see FIG. 4, CRC filed; see col. 4, lines 42-60, see col. 6, lines 8-12). Sambamurthy'713 discloses the collecting statistics about the number of error packets (see FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; note the statistical data is collected regarding the number of packets) and correction errors (see FIG. 4D, see col. 27, lines 12-37).

Neither Eng'557 nor Sambamurthy'713 explicitly discloses the collecting the number of corrected packets (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1); see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note that the URTM module (i.e. Channel Management Unit 90) collects the statistical data on the packets of error corrected packets). Moreover, well-established teaching in art also teaches that the collecting the number of corrected packets. Note that Sambamurthy'713 teaches collecting the counts of packets with errors, and performs error correction. Thus, it is clear that Sambamurthy'713's statistical table can be used to collect the counts of corrected packets after performing the error correction.

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Eng'557 and Sambamurthy'713, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Sambamurthy'713, for the purpose of

collecting the statistical data/counts of packets with corrected errors, as taught by Paratore'358 since Paratore'358 states in col. 2, lines 63 to col. 3, lines 4, 10-26, 55-65 that it will synchronize the a plurality of user equipment and a head end office. The motivation being that by collecting/storing the counts of packets with corrected errors, it can increase the monitoring capability by having knowledge of exact count of received packet, which are corrected due to errors, and it can synchronize between the system thereby reducing the error and failures.

Regarding claim 6, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets). Sambamurthy'713 discloses the collecting statistics about the number of packets (see FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; note the statistical data is collected regarding the number of packets).

Neither Eng'557 nor Sambamurthy'713 explicitly discloses the collecting FEC blocks and FEC blocks with corrected errors (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1) comprising Channel management unit 90, Burst Timing entity 92 and FEC/CRC 94; see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note that the Channel Management Unit collects the statistical data on the FEC packets and the FEC error corrected packets).).

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Eng'557 and Sambamurthy'713, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Sambamurthy'713, for the purpose of collecting the statistical data/counts of FEC packets and FEC error corrected packets, as taught by Paratore'358 for the same motivation as stated above in claims4 above.

Regarding claim 7, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets). Sambamurthy'713 further discloses collecting statistics about the number of packets with uncorrectable errors (see FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; Table 4; note the statistical data is collected regarding the number of uncorrectable errors (i.e. revError, errorFrame, errorOverFlow, errorCRE, and errorProtocol).

Neither Eng'557 nor Sambamurthy'713 explicitly discloses the collecting FEC blocks (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1) comprising Channel management unit 90, Burst Timing entity 92 and FEC/CRC 94; see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note

that the Channel Management Unit collects the statistical data on the FEC packets and the FEC packets with uncorrectable errors).

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Eng'557 and Sambamurthy'713, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Sambamurthy'713, for the purpose of collecting the statistical data/counts of FEC packets and FEC packets with uncorrectable errors, as taught by Paratore'358 for the same motivation as stated above in claim 4 above.

9. Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Sambamurthy'713, as applied to claim 1, and further in view of McConnell (U.S. 5,206,864).

Regarding claim 9, the combined system of Eng'557 and Sambamurthy'713 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 1.

Neither Eng'557 nor Sambamurthy'713 explicitly discloses the changing the coding gain (see McConnell'864 col. 2, lines 10-25; note that the coding gain is changed by increasing).

However, the above-mentioned claimed limitations are taught by McConnell'864. In view of this, having the combined system of Eng'557 and

Sambamurthy'713, then given the teaching of McConnell'864 it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Sambamurthy'713, for the purpose of increasing the coding gain of a system while maintaining high code rate and throughput, as taught by McConnell'864 since McConnell'864 states in col. 2, lines 14-26 that it will optimize the error correction capabilities. The motivation being that by increasing the code gain, it will optimize the error correction by correcting burst error and detecting whether the remaining data is error free.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Sambamurthy'713, as applied to claim 1, and further in view of Desrosiers (U.S. 6,434,199).

Regarding claim 10, the combined system of Eng'557 and Sambamurthy'713 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 1.

Neither Eng'557 nor Sambamurthy'713 explicitly discloses the changing the symbol rate (see Desrosiers'199 col. 3, lines 56 to col. 4, lines 4; note that the symbol rate is changed by increasing).

However, the above-mentioned claimed limitations are taught by Desrosiers'199. In view of this, having the combined system of Eng'557 and Sambamurthy'713, then given the teaching of Desrosiers'199 it would have been obvious to one having ordinary skill in the art at the time the invention was made to

modify the combined system of Eng'557 and Sambamurthy'713, for the purpose of increasing the symbol rate as taught by Desrosiers'199 since Desrosiers'199 states in col. 4, lines 1-4, see col. 2, lines 32-37 that it will eliminate the use of DACs and mapping circuit and not requiring tuning and low implementation complexity. The motivation being that by increasing the symbol rate, it will reduce the implementation complexity of the system thereby reducing the cost.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Sambamurthy'713, as applied to claim 1, and further in view of Isaksson (U.S. 6,438,174).

Regarding claim 12, the combined system of Eng'557 and Sambamurthy'713 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 1. Eng'557 further discloses utilizing different types of modulation (see col. 9, lines 25-46; note that different types of modulation (i.e. BPSK, QPSK, and QAM) are used in the headend. Headends directs the packets to be sending on different type of modulation. Thus, it is clear that the headend sends to change/modify physical layer parameters/limitations/requests (i.e. modulation types).)

Neither Eng'557 nor Sambamurthy'713 explicitly discloses the changing the constellation size (see Isaksson'174 col. 2, lines 30-44; note that the changing the constellation parameter used to modulate the carrier).

However, the above-mentioned claimed limitations are taught by Isaksson'174. In view of this, having the combined system of Eng'557 and Sambamurthy'713, then given the teaching of Isaksson'174 it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Sambamurthy'713, for the purpose of increasing the symbol rate as taught by Isaksson'174 since Isaksson'174 states in col. 4, lines 19-49, see col. 1, lines 12-15 that it will provide a multi-carrier transmission system using orthogonal carriers with high order QAM constellations for transmission of multiple bits per carrier and symbol. The motivation being that by utilizing orthogonal carrier with high order QAM constellation for transmission of multiple bits per carrier and symbol, it can increase the transmission of higher and fast bit rate traffic over the copper cables.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Sambamurthy'713, as applied to claim 1, and further in view of Mattisson (U.S. 6,246,713).

Regarding claim 15, the combined system of Eng'557 and Sambamurthy'713 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 1. Eng'557 further discloses changing/fine-tuning/adjusting the frequency of the carrier (see FIG. 16, Tuner 278; see col. 16, lines 26-42, see col. 10, lines 50-67; see col. 6, lines 12-31; note that the carrier or center frequency is changed/fin-tuned by performing "burst sync").

Thus, it is clear that a message to change the physical layer parameter is the changed/adjusted parameter.

Neither Eng'557 nor Sambamurthy'713 explicitly discloses the changing in a non-uniform manner (see Mattison'713 col. 1, lines 45 to col. 2, lines 10; note that a number of channels, n, are allocated for simultaneously used during the carrier frequency hopping/changing period).

However, the above-mentioned claimed limitations are taught by Mattison'713. In view of this, having the combined system of Eng'557 and Sambamurthy'713, then given the teaching of Mattison'713it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Sambamurthy'713, for the purpose of changing/hopping the carrier frequency as taught by Mattison'713 since Mattison'713 states in col. 1, lines 15-36 that it will reduce the interference and provide effective frequency hopping/changing. The motivation being that by changing/hopping carrier frequency within the allocated channels, it can reduce interference and increase bandwidth utilization.

13. Claims 17, 20 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Safadi (U.S. 5,696,765) in view of Eng (U.S. 5,963,557),

Regarding claim 17, Safadi'765 discloses a method for transmitting data over a cable system (see FIG. 1, CATV communication network 10) in an upstream direction to a headend (see FIG. 1, Headends/central offices 18 comprising network

controller) from a plurality of subscriber stations (see FIG. 1, a plurality of settop terminals (STTs) 16) located different distances from the headend such that the transmission paths to the headend are different (see FIG. 1, a plurality of STTs are located in different distances from the headends); the method comprising the steps of:

establishing an upstream channel from the subscriber stations to the headend (see FIG. 8A, Steps 300 and 304; note that STTs sends the reservation request for a time slot and channel towards the network controller in the headend; see col. 17, lines 44-67);

monitoring at the headend the transmission quality of the upstream channel (see FIG. 8A, step 312; note that the network controller in the headend monitors the transmission quality/value of the channel by monitoring channel activities to determine whether it is overloaded; see col. 18, lines 6-15; note that monitoring "the amount of activity" on the upstream channel is to monitoring the available time slot bandwidth and monitoring whether it is overloaded, which are the "transmission quality");

establishing a downstream channel from the headend to the subscriber stations (see FIG. 8A, step 306; note that the network controller in the headend sends establishment request acknowledgement message to requestor STTs via a downstream channel; see col. 17, lines 64 to col. 18, lines 4);

changing the mode of transmission at the headend if the monitored transmission quality fails to meet a prescribed threshold level (see FIG. 8B, Step

320, 321, 322,326; note that the network controller in the headend changes/modifies the transmission mode/type if the transmission quality/value of the monitored channel is degraded and does not meet/equal to a predetermined threshold; see col. 18, lines 15-25);

Safadi'765 does not explicitly discloses transmitting to the subscriber stations over the downstream channel a command to change the mode to the headend over the upstream channel (see FIG. 15, S20-S25; see col. 16, lines 58 to col. 17, lines 8; 46-67; see col. 18, lines 1-22; note that upon detecting the collision, the upstream transmitter sends the collision detected control/command packet to the downstream SS to change/modify the transmission mode/style);

receiving the command at the subscriber stations (see FIG. 13, S18-10; see col. 15, lines 21-46; note that the control/command packet is received at the SS before the timer expires) and

transmitting data over the upstream channel from the subscriber stations to the headend in accordance with the changed mode of transmission after receipt of the command (see FIG. 13, steps S11-614 and S14; col. 15, line 29 to col. 16, lines 5; note that in response to receiving a control/command packet via the upstream channel, the SS retries/retransmits to the headend according to the changed/modified transmission mode/type).

However, the above-mentioned claimed limitations are taught by Eng'557. In view of this, having the system of Safadi'765 and then given the teaching of Eng'557, it would have been obvious to one having ordinary skill in the art at the time

the invention was made to modify the system of Safadi'765, for the purpose of providing the mechanism for transmitting control/command packet from the headend to the subscriber to modify the transmission type and the subscribers sending the modified transmission type according to the control/command packet as taught by Eng'557, since Eng'557 states the advantages/benefits at col. 5, lines 30-35, col. 7, lines 55-64; col. 9, lines 46-56 that it overcome all disadvantages by reducing contention and increasing utilization of the bandwidth. The motivation being that by utilizing a control/packet to notify the subscriber regarding the collision status in the network upon detection, it can reduce the packet transmission failures and increase the network bandwidth since both the headend and subscriber are updated/synchronized regarding network failures.

Regarding claim 20, the combined system of Safadi'765 and Eng'557 discloses the monitoring circuit sends a message to change the physical layer parameter as described above in claim 17. Eng'557 further discloses collecting the channel statistics of the upstream channel (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290); see col. 17, lines 45-67; note that the headend controller collects/maintains the statistical of the upstream (i.e. number of collisions) channel),

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Safadi'765 as taught by

Eng'557, by providing the mechanism of collection channel statistics for the same motivation stated in Claim 17 above.

Regarding claim 32, the combined system of Safadi'765 and Eng'557 discloses the step of establishing an upstream channel has a bandwidth and the step of establishing a downstream channel establishes a channel that has a bandwidth as described above in claim 17. Safadi'765 further discloses an upstream channel is a channel that has a narrow bandwidth and a downstream channel is a channel that has a broad bandwidth (see col. 6, lines 16-28; note that an upstream channel has a bandwidth of 192 KHz, which is a narrow/small bandwidth, and the downstream channel has a bandwidth of 6 MHz, which is a broad/large bandwidth).

14. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Safadi'765 and Eng'557, as applied to claim 17 above, and further in view of McCarty (U.S. 5,513,029).

Regarding claim 18, the combined system of Safadi'765 and Eng'557 discloses the monitoring on the upstream channel as described above in claim 17.

Neither Safadi'765 nor Eng'557 explicitly discloses the noise power (see McCarty'029, Abstract, col. 6, line 25-36; note that the system monitors the noise power).

However, the above-mentioned claimed limitations are taught by McCarty'029. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of McCarty'029, it would have been obvious to one

having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of providing a mechanism of monitoring noise power, as taught by McCarty'029, since McCarty'029 states the advantages/benefits at col. 5, lines 60-67 that it would ensure near uniform capacity and quality of data channels. The motivation being that by monitoring the noise power, it can increase the network reliability by detecting and correcting errors or failures in the transmission channels.

Regarding claim 19, the combined system of Safadi'765 and Eng'557 discloses the monitoring on the upstream channel as described above in claim 17.

Neither Safadi'765 nor Eng'557 explicitly discloses the signal-to-noise power of a signal received (see McCarty'029, Abstract, col. 6, line 25-36; note that the system monitors and calculates the signal-to-noise ratio according to the monitored the noise power and signal power. Thus, it is clear that the system also monitors SNR).

However, the above-mentioned claimed limitations are taught by McCarty'029. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of McCarty'029, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of providing a mechanism of monitoring SNR, as taught by McCarty'029, for the same motivation as stated above in claim 18.

15. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Safadi'765 and Eng'557, as applied to claim 17 above, and further in view of Nixon (U.S. 5,995,916).

Regarding claim 21, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller of Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290 collects statistics regarding the number of packets).

Neither Safadi'765 nor Eng'557 explicitly discloses the collecting undetected packets (see Nixon'916, col. 32, line 39-54; note that statistical information is held/collected in counters which counts the received unknown protocol messages/packets, which are unable to detected).

However, the above-mentioned claimed limitations are taught by Nixon'916. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of Nixon'916, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of providing a mechanism for collection the counts of the received unknown protocol messages, as taught by Nixon'916, since Nixon'916 states the advantages/benefits at col. 3, lines 30-44 that it would provide a diagnostic monitoring of multiple system components. The motivation being that by collection/counting the counts of unknown protocol messages, it can increase the

diagnostic monitoring capability by having knowledge of exact count of received unknown messages.

16. Claims 22 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Safadi'765 and Eng'557, as applied to claims 17 above, and further in view of Paratore'358 (U.S. 5,666,358).

Regarding claim 22, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller of Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290 collects statistics regarding the number of packets). Eng'557 further discloses correction errors (see FIG. 4, CRC filed; see col. 4, lines 42-60, see col. 6, lines 8-12).

Neither Safadi'765 nor Eng'557 explicitly discloses the collecting the number of corrected packets (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1); see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note that the URTM module (i.e. Channel Management Unit 90) collects the statistical data on the packets of error corrected packets). Moreover, well-established teaching in art also teaches that the collecting the number of corrected packets. Note that Sambamurthy'713 teaches collecting the counts of packets with errors, and performs error correction. Thus, it is clear that Sambamurthy'713's statistical table can be used to collect the counts of corrected packets after performing the error correction.

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of collecting the statistical data/counts of packets with corrected errors, as taught by Paratore'358 since Paratore'358 states in col. 2, lines 63 to col. 3, lines 4, 10-26, 55-65 that it will synchronize the a plurality of user equipment and a head end office. The motivation being that by collecting/storing the counts of packets with corrected errors, it can increase the monitoring capability by having knowledge of exact count of received packet, which are corrected due to errors, and it can synchronize between the system thereby reducing the error and failures.

Regarding claim 24, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller of Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290 collects statistics regarding the number of packets).

Neither Safadi'765 nor Eng'557 explicitly discloses the collecting FEC blocks with corrected errors (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1) comprising Channel management unit 90, Burst Timing entity 92 and FEC/CRC 94; see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47;

note that the Channel Management Unit collects the statistical data on the FEC packets and the FEC error corrected packets).).

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of collecting the statistical data/counts of FEC packets and FEC error corrected packets, as taught by Paratore'358 for the same motivation as stated above in claim 22 above.

Regarding claim 25, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller of Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290 collects statistics regarding the number of packets).

Neither Safadi'765 nor Eng'557 explicitly discloses the collecting FEC blocks with uncorrected errors (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1) comprising Channel management unit 90, Burst Timing entity 92 and FEC/CRC 94; see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note that the Channel Management Unit collects the statistical data on the FEC packets and the FEC packets with uncorrected errors).

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Safadi'765 and

Eng'557, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of collecting the statistical data/counts of FEC packets and FEC packets with uncorrectable errors, as taught by Paratore'358 for the same motivation as stated above in claim 22 above.

Regarding claim 26, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller of Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290 collects statistics regarding the number of packets).

Neither Safadi'765 nor Eng'557 explicitly discloses a combination of two or more of the following: the number of undetected packets, the number of packets with corrected errors (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1); see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note that the URTM module (i.e. Channel Management Unit 90) collects the statistical data on the packets of error corrected packets), the number of packets with uncorrected errors, the number of FEC blocks with corrected errors, and the number of FEC blocks with uncorrected errors (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1) comprising Channel management unit 90, Burst Timing entity 92 and FEC/CRC 94; see Paratore'358 col. 10, lines 39-52; see col.

11, lines 14-47; note that the Channel Management Unit collects the statistical data on the FEC packets and the FEC packets with uncorrected errors).

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the same purpose and motivation as stated above in claim 22 above.

17. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Safadi'765 and Eng'557, as applied to claims 17 above, and further in view of Sambamurthy'713.

Regarding claim 23, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller of Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290 collects statistics regarding the number of packets).

Neither Safadi'765 nor Eng'557 explicitly discloses the collecting the number of uncorrected packets (see Sambamurthy'713 FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; Table 4; note the statistical data is collected regarding the number of uncorrectable errors (i.e. revError, errorFrame, errorOverFlow, errorCRE, and errorProtocol).

However, the above-mentioned claimed limitations are taught by Sambamurthy'713. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of Sambamurthy'713, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of collecting the statistical data/counts of packets with corrected errors, as taught by Sambamurthy'713 for the same motivation as stated above in claim 1.

18. Claim 27, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Safadi'765 and Eng'557, as applied to claims 17 above, and further in view Treadaway (U.S. 6,480,477).

Regarding claim 27 and 28, the combined system of Safadi'765 and Eng'557 discloses the command transmitting to change the mode of transmission to the headend over the upstream channel if the monitored quality fails to meet a prescribed threshold level.

Safadi'765 further discloses a first type of modulation (see FIG. 3, QAM MUX/MOD 52) that can reliably transmit at a high bit rate over a high quality channel (see FIG. 3, 27 Mbps; note that QAM is used to transmits at a high bit rate (i.e. 27Mbps) over a high quality channel (i.e. higher priority/quality services) since it is a high order quadrature amplitude modulation which utilizes FEC) and

a second type of modulation (see FIG. 3, QPSK Demod/mux 60) that can reliably transmit at a lower bit rate over a lower quality channel (see FIG. 3,

1.5Mbps; note that QPSK is used to transmits at a low bit rate (i.e. 1.5 Mbps) over a low quality channel (i.e. low priority/quality services); see col. 10, lines 26 to col. 13, lines 15).

Eng'557 discloses the monitoring circuit sends a message to change the physical layer parameter of different types of modulation (see col. 9, lines 25-46; note that different types of modulation (i.e. BPSK, QPSK, QAM) are used in the headend. Headends directs the packets to be sending on different type of modulation. Thus, it is clear that the headend sends to change/modify physical layer parameters/limitations/requests (i.e. modulation types).)

Neither Safadi'765 nor Eng'557 explicitly discloses changing from a first type (see Treadaway'477 FIG. 20, step 800, QAM) to a second type (see Treadaway'477 FIG. 20, step 808, QPSK) if the monitored quality at the first type of modulation fails to meet the prescribed threshold level (see Treadaway'477 FIG. 20, steps 802 and 804 with the condition yes; col. 26, lines 10-39; see col. 27, lines 20-28; note that modulations type QAM is changed to QPSK when the quality of QAM does not meet threshold conditions).

However, the above-mentioned claimed limitations are taught by Treadaway'477. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of Treadaway'477, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of changing from QAM to QPSK according the threshold, as taught by Treadaway'477 since Treadaway'477

states in col. 27, lines 28 that that by comparing with the threshold before changing the modulation, the hysteresis will reduce the frequency at which the manner of communication data is changed and prevents oscillations. The motivation being that by comparing with the threshold and switching from QAM to QPSK, it can reduce the error and failures in the network and prevents oscillation in the systems.

Regarding claim 29, the combined system of Safadi'765, Eng'557 and Treadaway'477 discloses the command transmitting to change the type of modulation from a first type to a second type as described above in claim 27. Eng'557 further discloses the data transmission transmits data to the headend in accordance with command after the command (see FIG. 15, S21, and FIG. 13, S13, S14, S17; see col. 16, lines 57-67, see col. 18, lines 1-5; see col. 15, lines 29-52; note that after the control packet is received from the downstream RF transmitter 256 to SS, SS retransmits the packets/payloads according to the changed/modified Physical layer parameter.) Thus, it is clear that the second type of modulation is performed and transmitted after receiving the command message.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system as taught by Eng'557, for the same motivation stated in Claim 17 above.

19. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Safadi'765 and Eng'557, as applied to claims 17 above, and further in view White (U.S. 5,491,725).

Regarding claim 33, the combined system of Safadi'765 and Eng'557 discloses monitoring and controlling steps at the headend as described above in claim 17.

Neither Safadi'765 nor Eng'557 explicitly discloses adjusting a notch filter (see White'725 FIG. 18, Adjustable Notch Filter 196/197) to establish coefficients (see White'725 FIG. 18, a value output, V13) that reject one or more bands of common noise (see White'725 see col. 3, lines 9-39; see col. 10, lines 29-46; note that a notch filter is adjusted to establish/output/produce a coefficient/value/signal that reject band of noise).

However, the above-mentioned claimed limitations are taught by White'725. In view of this, having the combined system of Safadi'765 and Eng'557, then given the teaching of White'725, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Safadi'765 and Eng'557, for the purpose of adjusting a notch filter to reject noise, as taught by White'725 since White'725 states in col. 3, lines 39-37 that that it will suppress the noise in the system. The motivation being that by implementing and adjusting notch filter, it can suppress/reject the noise in the system.

20. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eng (U.S. 5,963,557) in view of Ouyang (U.S. 5,572,511).

Regarding Claim 36, Eng'557 discloses a cable modem transmission system see FIG. 7, Headend 112; note that headend 112 is the cable modem transmission

system) having an upstream channel (see FIG. 7, Upstream control/payload channel) shared among a plurality of cable modems (see FIG. 7, three Subscriber Stations, SS, 150) and a burst receiver (see FIG. 14, a combined system of Upstream Payload channel RF receiver 254 and control channel RF receiver 255) connected to the upstream channel to process physical layer signals transmitted on the upstream channel (see col. 16, lines 42 to col.17, lines 6; note that the combined system of receivers process mini-slot status information signals transmitted by subscriber station SS via upstream channel) a monitoring circuit (see FIG. 14, a headend controller which comprises Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) for collecting packet based statistics representative of the transmission quality of the upstream channel (see col. 17, lines 45-67; note that the headend controller collects/maintains the statistical quality data (i.e. number of mini-slot collisions) regarding the packets/payload; note that the statistical data, which represent the transmission quality, is the same as the number of collision, which represent the transmission quality, since collision has a significant impact on the quality of the transmission), the monitoring circuit comprising

an input for receiving the physical layer signals from the burst receiver (see FIG. 14, note that the headend controller comprises an input to receive mini-slot status data/signals from the combined receivers 254 and 255; also note that mini slot are generated and processed at the physical layer; see col. 16, lines 26-42; see col. 17, lines 58-65),

means for sensing parameters that control the manner of transmission of the physical layer signals (see FIG. 14, the headend controller (i.e. Collision Detector 290; mini slot information controls the manner in which data signals are transmitted by way of the collision statistics (i.e. number of collisions)) senses/detects mini slot collision status information/parameters signals; see col. 17, lines 1-9, 22-67), and

a counter (see FIG. 14, contention resolution circuit 234) for collecting the sensed physical layer parameters (col. 17, lines 56 to col. 18, lines 23; note that the contention resolution circuits collects and maintains statistic of the mini-slot collisions status information/parameters).

Eng'557 does not explicitly disclose plurality of counters (see Ouyang'511 FIG. 3, Collision Counters, 34; see col. 2, lines 3-24; 40-65; note that the collision counters 34 collect and detect the M times of collision in N times of transmission.)

However, the above-mentioned claimed limitations are taught by Ouyang'511. In view of this, having the system of Eng'557 and then given the teaching of Ouyang'511, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Eng'557, for the purpose of providing the collision counters, as taught by Ouyang'511, since Ouyang'511 states the advantages/benefits at col. 1, lines 55-61, see col. 2, lines 55-6, that it would continuously collect and detect the M number collisions in N number of transmission which prevents causing trouble and inconvenience of data transmission. The motivation being that by utilizing more than one counter, it will increase rate and

reliability since the counters can continuously collect and detect the plurality of collision over plurality of transmission.

21. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Ouyang'511, as applied to claim 36 above, and further in view of Nixon (U.S. 5,995,916).

Regarding claim 37, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets.

Neither Eng'557 nor Ouyang'511 explicitly discloses the collecting undetected packets (see Nixon'916, col. 32, line 39-54; note that statistical information is held/collected in counters which counts the received unknown protocol messages/packets, which are unable to detected).

However, the above-mentioned claimed limitations are taught by Nixon'916. In view of this, having the combined system of Eng'557 and Ouyang'511, then given the teaching of Nixon'916, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Ouyang'511, for the purpose of providing a mechanism for collection the counts of the received unknown protocol messages, as taught by Nixon'916, since Nixon'916 states the advantages/benefits at col. 3, lines 30-44 that it would

provide a diagnostic monitoring of multiple system components. The motivation being that by collection/counting the counts of unknown protocol messages, it can increase the diagnostic monitoring capability by having knowledge of exact count of received unknown messages.

22. Claims 38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Ouyang'511, as applied to claim 36 above, and further in view of Sambamurthy'713.

Regarding claim 38, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller comprising Headend Media Access Controller 262, Mini slot collection status 294 and collection detector 290 collects statistics regarding the number of packets).

Neither Eng'557 nor Ouyang'511 explicitly discloses without a unique word (see Sambamurthy'713 FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; Table 4 and 5; note the statistical data is collected regarding the number of un-valid packet whose word/byte is not unique/standard size (i.e. errorLong and errorShort).

In view of this, having the combined system of Eng'557 and Ouyang'511, then given the teaching of Sambamurthy'713, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Ouyang'511, for the purpose of providing mechanism of

collection un-valid packet without a unique word, as taught by Sambamurthy'713, since Sambamurthy'713 states the advantages/benefits at col. 12, lines 30-44, that it would provide a capability to store each event and process in the system. The motivation being that by collection invalid packet with non-unique word, it will increase the network reliability since such collected data can be used to make an accurate decision/determination in order to avoid errors and failures.

Regarding claim 40, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets).

Neither Eng'557 nor Ouyang'511 explicitly discloses uncorrectable errors (see Sambamurthy'713FIG. 2, Statistical Counters 128; see col. 12, lines 32-44; see col. 16, lines 24-5 to col. 17, lines 20; see col. 27, lines 36 to col. 18, lines 9, see col. 29, lines 32-63; Table 4; note the statistical data is collected regarding the number of uncorrectable errors (i.e. revError, errorFrame, errorOverFlow, errorCRE, and errorProtocol).

In view of this, having the combined system of Eng'557 and Ouyang'511, then given the teaching of Sambamurthy'713, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Ouyang'511, for the purpose of providing mechanism of

collection the packet with uncorrectable errors, as taught by Sambamurthy'713, for the same motivation as described above in claim 38.

23. Claims 39,41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eng'557 and Ouyang'511, as applied to claim 36 above, and further in view of Paratore'358 (U.S. 5,666,358).

Regarding claim 39, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets). Eng'557 further discloses correction errors (see FIG. 4, CRC filed; see col. 4, lines 42-60, see col. 6, lines 8-12).

Neither Eng'557 nor Ouyang'511 explicitly discloses the collecting the number of corrected packets (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1); see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note that the URTM module (i.e. Channel Management Unit 90) collects the statistical data on the packets of error corrected packets).

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Eng'557 and Ouyang'511, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Ouyang'511, for the purpose of collecting the

statistical data/counts of packets with corrected errors, as taught by Paratore'358 since Paratore'358 states in col. 2, lines 63 to col. 3, lines 4, 10-26, 55-65 that it will synchronize the a plurality of user equipment and a head end office. The motivation being that by collecting/storing the counts of packets with corrected errors, it can increase the monitoring capability by having knowledge of exact count of received packet, which are corrected due to errors, and it can synchronize between the system thereby reducing the error and failures.

Regarding claim 41, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller (i.e. Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290) collects statistics regarding the number of packets).

Neither Eng'557 nor Ouyang'511 explicitly discloses the collecting FEC blocks and FEC blocks with corrected errors (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1) comprising Channel management unit 90, Burst Timing entity 92 and FEC/CRC 94; see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note that the Channel Management Unit collects the statistical data on the FEC packets and the FEC error corrected packets).).

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Eng'557 and Ouyang'511, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the

combined system of Eng'557 and Ouyang'511, for the purpose of collecting the statistical data/counts of FEC packets and FEC error corrected packets, as taught by Paratore'358 for the same motivation as stated above in claim 39 above.

Regarding claim 42, Eng'557 discloses the monitoring circuit collects statistics about the number of packets (see FIG. 14, a headend controller comprising Headend Media Access Controller 262, Reservation Requests 292, Mini slot collection status 294 and collection detector 290 collects statistics regarding the number of packets).

Neither Eng'557 nor Ouyang'511 explicitly discloses the collecting FEC blocks (see Paratore'358 FIG. 4, Upstream Real time Processing Module, URTM, 26(1) comprising Channel management unit 90, Burst Timing entity 92 and FEC/CRC 94; see Paratore'358 col. 10, lines 39-52; see col. 11, lines 14-47; note that the Channel Management Unit collects the statistical data on the FEC packets and the FEC packets with FEC errors packets (i.e. number of uncorrectable error)).

However, the above-mentioned claimed limitations are taught by Paratore'358. In view of this, having the combined system of Eng'557 and Ouyang'511, then given the teaching of Paratore'358, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Eng'557 and Ouyang'511, for the purpose of collecting the statistical data/counts of FEC packets and FEC packets with uncorrectable errors, as taught by Paratore'358 for the same motivation as stated above in claim 39 above.

Allowable Subject Matter

24. Claims 30,31, 34 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

25. Applicant's arguments filed 11-12-2004 have been fully considered but they are not persuasive.

Regarding claim 1-29,32,33,36-42, the applicant argued that, "...Eng does not teach or suggest... collecting packet based statistics representative of the transmission quality of the upstream channel... the level of traffic on the upstream channel is not same as the "transmission quality"" " in page 16, paragraph 5 and page 17, paragraph 1; page 28, last paragraph; page 29, last paragraph.

Regarding claims 1-29,32,33,36-42, in response to applicant's argument, the examiner respectfully disagrees that Eng does not teach or suggest the above argued limitations.

In particular, Eng teaches collecting packet based statistics representative of the transmission quality of the upstream channel (**see col. 17, lines 45-67; note that the headend controller collects/maintains the statistical transmission quality data (i.e. number of mini-slot collisions) regarding the packets/payload**). Note that number of collision in the network affects the quality

the transmission of data, that is, the lesser the collision the higher the quality of upstream channel, and the greater the collision the lesser the quality of upstream channel. Moreover, it is clear that the statistical data, which represent the transmission quality, is the same as the number of collision, which represent the transmission quality, since collision has a significant impact on the quality of the transmission. Thus, Eng clearly discloses the argued limitation.

Regarding claim 1-29,32,33,36-42, the applicant argued that, "...the term channel quality is clearly defined in the specification...**the ability of a channel to transmit data reliability thereon, such that higher quality channels transmit data reliably at a higher quality channels transmit data reliably at a higher data rate than lower quality channels**..." in page 16, paragraphs 5-6; page 25, paragraph 2.

Regarding claims 1-29,32,33,36-42, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., **the ability of a channel to transmit data reliability thereon, such that higher quality channels transmit data reliably at a higher quality channels transmit data reliably at a higher data rate than lower quality channels**) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Regarding claim 1-29,32,33,36-42, the applicant argued that, "...Eng, Sambamurthy does not teach or suggest a monitoring circuit that sends "a message to the transmitter for the cable modems to change a physical parameter responsive to the collected statistics and to the burst receiver to process data signals based on the changed physical layer parameter...time interval allocation is not a physical layer parameter....Eng and Sambamurthy fails to teach or suggest each an every feature...references cannot support a prima facie obviousness rejection of that claim..." in page 17, paragraph 2; and page 18, paragraph 2.

Regarding claims 1-29,32,33,36-42, i**n response to applicant's arguments** against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument, **the examiner respectfully disagrees** that Eng, Sambamurthy does not teach or suggest above argued limitations.

Eng discloses a monitoring circuit **(see FIG. 14, a headend controller which comprises Headend Media Access Controller 262, Mini slot collection status 294 and collection detector 290; see col. 16, lines 25-27)** sending a message to the transmitter for the cable modems (**see FIG. 7, Subscriber Stations, SS, 150**) to change a physical layer parameter **(col. 17, lines 8; 46-67; a mini-slot status information in a control message; also note that mini slot are generated and**

processed at the physical layer) responsive to the collected statistics (**see FIG. 15, S20-S25; see FIG. 13, S11-S14 and S17; see col. 16, lines 58 to col. 17, lines 8; 46-67; see col. 18, lines 1-22; see col. 15, lines 29-46; note that according to maintained/collected mini-slot collision statistics, the headend controller instructs the downstream RF transmitter to change/update mini-slot status information by sending a control message (i.e. see FIG. 14, collection status message). Consequently, the upstream transmitter sends the collision detected control packet to the downstream SS to change/modify the mini-slot status information. In response to receiving a control packet, the SS changes/modifies the mini-slot status information by determining when to retry**) and

the burst receiver process data signals based on the changed physical layer parameter (**see FIG. 15, S21, and FIG. 13, S13, S14, S17; see col. 16, lines 57-67, see col. 18, lines 1-5; see col. 15, lines 29-52; note that after the control packet is send from the downstream RF transmitter 256 to SS, SS retransmits the packets/payloads according to the changed/modified mini-slot status information. The combined system of receivers processes the packet according to the changed/modified mini-slot status**).

Sambamurthy discloses a monitoring circuit (**see FIG. 2, a combined system of microRISC stream processor 114 and Super MAC management 117**) sending a message (**see FIG. 2, an instruction/message is sent to/from the combined management system**) to the transmitter (**see FIG. 2, Tx Super MAC controller**

118) to change a physical layer parameter responsive to the collected statistics (**see col. 10, lines 42 to col. 11, lines 52; see col. 12, lines 32-42; note that the combined management system sends the management/control command/instruction to the transmitter to change/modify the physical layer parameter/limitation according to the stored statistics**) and

to the receiver (**see FIG. 2, Rx Super MAC Controller 120**) to process data signals based on the changed parameter (**see col. 10, lines 42 to col. 11, lines 52; see col. 12, lines 32-42; note that the combined management system sends the management/control command/instruction to the receiver to process the packet/data/signal according to the changed/modified the physical layer parameter/limitation; see col. 12, lines 56 to col. 13, lines 37; also see FIG. 3**).

As stated above the physical layer parameter is the mini slot information, which are processed at the physical layer, and the headend controller instructs RF transmitter to change/update mini-slot status information by sending a control message. Thus, it is clear that mini slot information controls the manner in which data signals are transmitted by way of the collision statistics (i.e. number of collisions).

Thus, it is clear that the combined system of Eng and Sambamurthy clearly disclosed above argued limitations.

Regarding claim 17-29,32,33, the applicant argued that, "...Safadi does not tech or suggest...monitoring at the headend the transmission quality of the upstream channel...amount of activity on the upstream channel is not the same as

the "transmission quality"..." in page 24, last paragraph; page 25, paragraph 3; page 27, paragraph 7.

Regarding claims 17-29,32,33, in response to applicant's argument, the examiner respectfully disagrees that does not teach or suggest above argued limitations.

Safadi discloses monitoring at the headend the transmission quality of the upstream channel (**see FIG. 8A, step 312; monitor channel activity; note that the network controller in the headend monitors the transmission quality/value of the channel by monitoring channel activities to determine whether it is overloaded; see col. 18, lines 6-15**; note that monitoring "the amount of activity" on the upstream channel is to monitoring the available time slot bandwidth and monitoring whether it is overloaded, which are the "transmission quality".

Regarding claim 17-29,32,33, the applicant argued that, "...Safadi does not tech or suggest...transmitting to the subscriber stations over the downstream channel a command to change the mode of transmission to the headend over the upstream channel if the monitored transmission quality fails to meet a prescribed threshold level...Safadi and Eng fails to teach or suggest each and every feature of claim 17.... references cannot support a prima facie obviousness rejection of that claim..." in page 25, paragraph 4; page 26, paragraph 1; page 27, paragraph 7.

Regarding claims 17-29,32,33, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of

references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument, **the examiner respectfully disagrees** that Safadi and Eng does not teach or suggest above argued limitations.

Safadi discloses changing the mode of transmission at the headend if the monitored transmission quality fails to meet a prescribed threshold level (**see FIG. 8B, Step 320, 321, 322,326; note that the network controller in the headend changes/modifies the transmission mode/type if the quality/value of the monitored channel is degraded and does not meet/equal to a predetermined threshold; see col. 18, lines 15-25**).

Eng discloses transmitting to the subscriber stations over the downstream channel a command to change the mode to the headend over the upstream channel **(see FIG. 15, S20-S25; see col. 16, lines 58 to col. 17, lines 8; 46-67; see col. 18, lines 1-22; note that upon detecting the collision, the upstream transmitter sends the collision detected control/command packet to the downstream SS to change/modify the transmission mode/style)**.

Thus, it is clear that the combined system of Safadi and Eng clearly disclosed above argued limitations.

In view of the above, **the examiner respectfully disagrees** with applicant's argument and believes that the combination of references as set forth in the 103 rejections are proper.

Conclusion

26. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N Moore whose telephone number is 571-272-3085. The examiner can normally be reached on M-F: 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau T Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

INM
JJM
4/7/05

BOB PHUNKULH
PRIMARY EXAMINER